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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,302	09/26/2003	Hong Jin	7382-132-999	4464

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EXAMINER
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ART UNIT	PAPER NUMBER
1648	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/672,302	JIN ET AL.	
	Examiner	Art Unit	
	Benjamin P. Blumel	1648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *June 11, 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3,13,21-44,46,54,55,58-60,64 and 241-247* is/are pending in the application.

4a) Of the above claim(s) *3,13,21-44 and 58-60* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *46,54,55 and 241-247* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 September 2003* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

This application contains claims 2, 13, 21-44 and 58-60 are drawn to an invention nonelected without traverse in the reply filed on July 26, 2006. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Response to Arguments

Applicant's arguments filed June 11, 2007 have been fully considered but they are not persuasive. See response below.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

(New Rejection Necessitated by Amendment) Claims 46, 54, 55 and 242 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being

unpatentable over claims 1, 6, 10, 11, 35, 39, 46, 48 and 53 of copending Application No. 10/811,508 in view of Marriott et al., *see below.* Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed invention of the copending application is drawn to an immunogenic composition comprising a recombinant RSV with amino acid mutations in viral proteins. However, even though the claimed invention does not specifically state a phosphoprotein being mutated, the invention of the instant application is obvious in view of the claimed invention of '508 and the teachings of Marriott et al., *see below.*

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(Prior Rejection Maintained) Claims 46, 54, 55 and 241-247 are rejected under 35 U.S.C. 102(a) as being anticipated by Lu et al. (Journal of Virology, 2002).

Applicants argue that Lu et al. is not a statutory bar to patentability given the priority of the instant application dating to **6 months after** the publication of Lu et al. and also that three of the four inventors are coauthors of Lu et al. Therefore, the applicants argue that the work of Lu et al. is their own work. Applicant's state that a Declaration Under 37 C.F.R. § 1.132 will be

filled stating that the evidence of Lu et al. is that of the inventors and occurred less than one year from filing of the instant application. In response, the Lu et al. paper was coauthored by 3 individuals not stated as inventors, Robert Brazas, Chien-Hui Ma, and Tina Kristof, which made Lu et al. considered as "known or used by others in this country...before the invention thereof". Since no Declaration Under 37 C.F.R. § 1.132 was filed, the rejection is maintained for reasons of record.

(Prior Rejection Maintained) Claims 46, 54, 55, 241, 242 and 247 are rejected under 35 U.S.C. 102(b) as being anticipated by Marriott et al. (Journal of Virology, 1999).

Applicants argue that Marriott et al. do not teach nucleic acids encoding a virus with a mutated P protein and that Marriott et al. merely uses a minigenome to analyze the effects of mutating the P protein. In response, Marriott et al. discusses that a mutation of the P protein of a subgroup A RSV (*ts*N19) by changing a Glycine to a Serine at position 172 results in an attenuated virus based on temperature sensitivity as first discussed by Caravokoyri et al. Journal of General Virology, 1992). Marriott et al. also report that upon the sequencing of two additional temperature sensitive RSV strains, RSN-2 and a revertant virus, *ts*+ R3/6 contained the same amino mutation as in *ts*N19, which was also sequenced. With regard to the specific example provided by it is acknowledged that Marriott et al. do not obtain recombinant virus from transfecting vaccinia virus infected Hep-2 cells with multiple plasmids, each containing various RSV proteins. However, it is noted that a similar system is employed by the applicants on pages 72 and 73 and as taught by Jin et al. (Virology, 1998). Therefore, RSV *ts*N19 anticipates that of the claimed invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(New Rejection Necessitated by Amendment) Claims 243-246 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marriott et al. *supra* as applied to claims 46, 54, 55, 241, 242 and 247 above, and further in view of Khattar et al. (Journal of General Virology, 2001) and Girault (Encyclopedia of Molecular Biology, 1999).

The instant invention is drawn to an immunologically effective amount of a live attenuated recombinant respiratory syncytial virus of subgroup A (RSV) with an attenuated phenotype and comprises a phosophoprotein (P) with one mutated or substituted amino acid residue. The altered amino acid residue is located at positions 176 of the P protein and this alteration eliminates a phosphorylation site. The instant invention is also drawn to the nucleic acid, which encodes the RSV of the instant invention.

The teachings of Marriott et al. are discussed above. However, Marriott et al. do not teach a mutation of the amino acid at position 176 of the P protein which results in the elimination of a phosphorylation site.

Khattar et al. teach the essential interaction of Bovine RSV P protein and Nucleoprotein (N) in viral replication. Khattar et al. examined the effects of various deletions on the P protein's interaction with the Nucleoprotein and observed a dissociated interaction when amino acid regions 161-180 or 221-241 of the P protein were deleted (see figure 3A).

Girault teaches the ubiquitous involvement of protein phosphorylation and protein activity or protein-protein interactions. Several amino acids can be phosphorylated (see table 1). Based on the teachings of Girault, 10 of 20 residues between the 161-180 amino acid range of Bovine RSV P protein, as taught by Khattar et al. above, can be altered by phosphorylation. These positions are 161, 163, 164, 167, 168, 174, 175, 176 and 179.

It would have been obvious to one of ordinary skill in the art to modify the composition taught by Marriott et al. in order to obtain an immunogenic recombinant RSV of subgroup A with an amino acid substitution at position 176, thereby generating an attenuated RSV. One would have been motivated to do so, given the suggestion by Marriott et al. that the amino acid substitution at position 172 results in a temperature-sensitive, recombinant RSV. There would have been a reasonable expectation of success, given the knowledge that the interaction of the P protein and nucleoprotein of Bovine RSV is interrupted by deleting amino aicds 161-180, as taught by Khattar et al., and also given the knowledge that phosphorylation of amino acids that are located within the 161-180 amino acid region of the P protein can interfere

with protein-protein interactions, as taught by Girault et al. Thus the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Summary

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin P. Blumel whose telephone number is 571-272-4960. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bruce Campell can be reached on 571-272-1600. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Benjamin P Blumel/
Examiner
Art Unit 1648

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